

CLAIMS

1. A processing device (11) characterized by having:

process means (14, 50) which has a chamber (13) and performs a predetermined
5 process on a process target in said chamber (13);

first exhaust means (22) which is connected to said chamber (13) and pumps inside
said chamber (13) to a predetermined vacuum pressure;

second exhaust means (23) which is connected to said first exhaust means (22) and
pumps inside said chamber (13) to a pressure at which said first exhaust means (22) is
10 operable;

information acquisition means (24, 56, 61) which is arranged between said first
exhaust means (22) and said second exhaust means (23) and acquires information about a
predetermined matter in an exhaust gas exhausted from said chamber (13); and

control means (12) which discriminates a status inside said chamber (13) based on
15 said information acquired by said information acquisition means (24, 56, 61) and controls
said process means.

2. A processing device characterized by having:

a process section (14, 50) which has a chamber (13) and performs a predetermined
process on a process target in said chamber (13);

20 a first exhaust section (22) which is connected to said chamber (13) via a first
exhaust pipe (25) and pumps inside said chamber (13) to a predetermined vacuum pressure;

a second exhaust section (23) which is connected to an exhaust side of said first
exhaust section (22) via a second exhaust pipe (28) smaller in diameter than said first
exhaust pipe (25) and pumps inside said chamber (13) to a pressure at which said first
25 exhaust section (22) is operable;

an information acquisition section (24, 56, 61) which acquires information about a
predetermined matter in an exhaust gas exhausted from said chamber (13) and flowing in

said second exhaust pipe (28); and

a control section (12) which discriminates a status inside said chamber (13) based on said information acquired by said information acquisition section (24, 56, 61) and controls said process section (14, 50).

5 3. The processing device according to claim 2, characterized by further having a measurement pipe (30) which is branched from said second exhaust pipe (28) and bypasses said exhaust gas flowing in said second exhaust pipe (28) and in that said information acquisition section (24, 56, 61) acquires said information from said exhaust gas flowing in said measurement pipe (30).

10 4. The processing device according to claim 2, characterized in that said information acquisition section (24, 56, 61) has an infrared spectroscopic analysis device (24) or a mass spectrometry device (61) which measures a concentration of said predetermined matter and said control section (12) controls said process section (14, 50) based on the concentration of said predetermined matter measured by said information
15 acquisition section (24, 56, 61).

5. The processing device according to claim 2, characterized in that said information acquisition section (24, 56, 61) has an infrared spectroscopic analysis device (24) which measures a distribution of a fragment matter in said exhaust gas and said control section (12) controls said process section (14, 50) based on the distribution of said fragment
20 matter measured by said information acquisition section (24, 56, 61).

6. A processing device characterized by having:
a chamber (13);
gas supply means (14, 50) which is connected to said chamber (13) and supplies one process gas in a plurality of process gases into said chamber (13) for a predetermined
25 time;

first exhaust means (22) which is connected to said chamber (13) and pumps inside said chamber (13) to a predetermined vacuum pressure;

second exhaust means (23) which is connected to said first exhaust means (22) and pumps inside said chamber (13) to a pressure at which said first exhaust means (22) is operable;

measuring means (24, 56, 61) which is arranged between said first exhaust means (22) and said second exhaust means (23) and measures an amount of said process gas in an exhaust gas exhausted from said chamber (13); and

control means (12) which controls supply of another process gas by said gas supply means (14, 50) based on the amount of said process gas measured by said measuring means (24, 56, 61).

10 7. The processing device according to claim 6, characterized in that said control means (12) starts supplying another process gas into said chamber (13) by said gas supply means (14, 50) when the amount of said process gas in said exhaust gas is reduced to a predetermined amount.

8. A processing device characterized by having:
15 a chamber (13) in which a predetermined process is performed on a process target;
 cleaning means (50) which cleans inside said chamber by supplying a cleaning gas for purifying inside said chamber (13);

 first exhaust means (22) which is connected to said chamber (13) and pumps inside said chamber (13) to a predetermined vacuum pressure;

20 second exhaust means (23) which is connected to said first exhaust means (22) and pumps inside said chamber (13) to a pressure at which said first exhaust means (22) is operable;

 information acquisition means (24, 56, 61) which is arranged between said first exhaust means (22) and said second exhaust means (23) and acquires information about a
25 pollutant in an exhaust gas exhausted from said chamber (13); and

 control means (12) which discriminates a pollution status inside said chamber (13) based on said information acquired by said information acquisition means (24, 56, 61) and

controls said cleaning means (50).

7. The processing device according to claim 6, characterized in that said pollutant is particles and said control means (12) cleans inside said chamber (13) when an amount of said particles in said exhaust gas becomes equal to or greater than a predetermined amount.

5 8. The processing device according to claim 7, characterized in that said information acquisition means (24, 56, 61) has an optical counter (56) which measures the amount of particles in said exhaust gas.

9. The processing device according to claim 6 or 7, characterized in that said information acquisition means (24, 56, 61) further has byproduct measuring means (24, 61) which measures an amount of a byproduct produced by said cleaning in said exhaust gas, and

said control means (12) controls said cleaning means (50) based on the amount of said byproduct measured by said byproduct measuring means (24, 61).

10. The processing device according to claim 6, characterized in that said information acquisition means (24, 56, 61) has a mass spectrometry device (61) which measures a type and an amount of a metal element in said exhaust gas, and said control means (12) controls said cleaning means (50) based on the type and amount of the metal element measured by said information acquisition means (24, 56, 61).

11. A processing method having:
20 a process step which performs a predetermined process in a chamber retaining a process target inside,

a first exhaust step which causes a main exhaust section connected to said chamber to pump inside said chamber to a predetermined vacuum pressure, and

a second exhaust step which causes a sub exhaust section connected to said main exhaust section to pump inside said chamber to a pressure at which pumping in said first exhaust step is possible, characterized by having:

an information acquisition step which acquires information about a predetermined

matter in an exhaust gas exhausted from said chamber in said first exhaust step and flowing between said main exhaust section and said sub exhaust section; and

a control step which discriminates a status inside said chamber and controls said process based on said information acquired in said information acquisition step.

5 12. A processing method having:

a process step which performs a predetermined process in a chamber retaining a process target inside,

a first exhaust step which causes a main exhaust section connected via a first exhaust pipe to said chamber to pump inside said chamber to a predetermined vacuum pressure, characterized by having:

a second exhaust step which causes a sub exhaust section connected to said main exhaust section via a second exhaust pipe smaller in diameter than said first exhaust pipe to pump inside said chamber to a pressure at which pumping in said first exhaust step is possible;

15 an information acquisition step which acquires information about a predetermined matter in an exhaust gas exhausted from said chamber in said first exhaust step and flowing in said second exhaust pipe; and

a control step which discriminates a status inside said chamber and controls said process based on said information acquired in said information acquisition step.

20 13. The processing method according to claim 12, characterized in that in said second exhaust step, inside said chamber is pumped out by the sub exhaust section connected to said main exhaust section via said second exhaust pipe and a measurement pipe for bypassing a gas flowing in said second exhaust pipe, and

in said information acquisition step, said information is acquired from said exhaust gas flowing in said measurement pipe.

25 14. The processing method according to claim 12, characterized in that in said information acquisition step, a concentration of said predetermined matter is measured by

an infrared spectroscopic analysis device or a mass spectrometry device and in said control step, said process is controlled based on said concentration measured in said information acquisition step.

15. A processing method characterized by having:

5 a gas supply step which supplies one process gas in a plurality of process gases into a chamber retaining a process target inside for a predetermined time;

a first exhaust step which causes a main exhaust section connected to said chamber to pump inside said chamber to a predetermined vacuum pressure;

10 a second exhaust step which causes a sub exhaust section connected to said main exhaust section to pump inside said chamber to a pressure at which pumping in said first exhaust step is possible;

a measuring step which measures an amount of said process gas in an exhaust gas exhausted from said chamber in said first exhaust step and flowing between said main exhaust section and said sub exhaust section; and

15 a control step which controls supply of another process gas in said gas supply step based on the amount of said process gas measured in said measuring step.

16. A processing method characterized by having:

a process step which performs a predetermined process in a chamber retaining a process target inside;

20 a cleaning step which cleans inside said chamber by supplying a cleaning gas for purifying inside said chamber;

a first exhaust step which causes a main exhaust section connected to said chamber to pump inside said chamber to a predetermined vacuum pressure, and

25 a second exhaust step which causes a sub exhaust section connected to said main exhaust section to pump inside said chamber to a pressure at which pumping in said first exhaust step is possible;

an information acquisition step which acquires information about a pollutant in an

exhaust gas exhausted from said chamber in said first exhaust step and flowing between said main exhaust section and said sub exhaust section; and

a control step which discriminates a pollution status inside said chamber and controls cleaning in said chamber in said cleaning step based on said information acquired in said information acquisition step.